I. C. 7068 APRIL 1939

UNITED STATES
DEPARTMENT OF THE INTERIOR
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BUREAU OF MINES
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REQUIREMENTS FOR VENTILATION - ALABAMA MINING LAW

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BY

FRANK E. CASH

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UNITED STATES DEPARTMENT OF THE INTERIOR - BUREAU OF MINES

REQUIREMENTS FOR VENTILATION - ALABAMA MINING LAW[1/]

By Frank E. Cash[2/]

INTRODUCTION

Since ventilation adequate in quantity as well as quality is of paramount importance to the health and safety of men working underground in coal mines, mining officials, employees, and State inspection departments should give it the closest possible attention.

MINING LAW OF ALABAMA

The law governing and regulating the operation of coal mines in Alabama was enacted in 1911 and amended or revised in 1923, 1928, 1930, and 1935. The original law and subsequent revisions were progressive steps in safeguarding the health and safety of underground employees.

The 1935 revision changed 52 of the 131 sections on the regulation of coal mining. These changes were made and agreed upon by a committee representing labor, operators, and the State inspection department and were recommended and approved by an Act of the Alabama Legislature July 17, 1935.

Scope

It is not the intention of this report to enumerate or call attention to all of the 1935 revisions, but to discuss ventilation.

Section 24 in the 1928 and 1930 revisions of the Mining Law of Alabama follows:

> Reports Furnished Inspector as to Ventilation.
>
> Whenever the chief mine inspector shall require it, the owner, operator, or lessee of any coal mines shall send to the chief mine inspector, on blanks furnished by him for that purpose, a report showing the amount of ventilation at the

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inlet or outlet; the amount of ventilation at or near the last crosscut in each split, the number of splits and the number of men and animals on each split. The report shall also include a record of the pressure gage readings.

In the 1935 revision the above section number was changed to 1624 and is as follows:

Reports Furnished Inspector as to Ventilation.

The owner, operator, or lessee of any gassy coal mines shall send to the chief mine inspector a monthly report, or more often if necessary, showing the amount of ventilation at the inlet and outlet; the amount of ventilation at or near the last crosscut in each working entry, the methane content of same, whether split or continuous system, the number of splits, and the number of men and animals on each split. The report shall also include a record of the pressure gage readings at fan. The above provisions apply to nongrassy mines, except methane content of mine atmosphere.

Discussion

Most, if not all, of the States having laws governing coal mining require that the volume of air be measured at specified points periodically, but few of them stipulate similar requirements as to quality. Without quantity, quality could not be determined, but volume in itself is not enough.

A review of various State mining laws indicates that Alabama was the first and at present is the only State requiring that the methane content of the ventilating current be determined at specific points in gassy coal mines and the data furnished the State inspection department not less often than every 30 days.

The nearest approach to this law is an amendment to the bituminous mining laws of Pennsylvania enacted by the 1937 legislature and providing that the inspection department can request and obtain the methane content of mine air periodically.

The immediate reaction of some operators and mining men to this 1935 revision or amendment to the Alabama mining law was "It is no more than we have been doing or should be required to do", while others felt that it was an unnecessary requirement.

For many years flame safety lamps have been, and until some more reliable practical equipment is devised will be, essential for determining the quality of coal-mine ventilation, including approximations as to both methane and oxygen content, knowledge of both being of paramount importance for safety in coal mines.

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In their present state of development, the use of methane detectors only supplements the use of flame safety lamps; but when safe and practical devices are available for the accurate detection of methane in quantities of from 0.1 to 5.0 percent, it would seem inadvisable to depend on flame safety lamps, except to determine oxygen sufficiency because detectors at present do not give adequate information as to the oxygen content of the air.

In general, the user of a flame safety lamp will not detect less than 1-1/2 to 2-1/2 percent of explosive gas. In some places and under some conditions this amount of explosive gas may not be dangerous, but in other places or under other conditions in the same or other mines it may be extremely hazardous.

Alabama Explosions

From 1894 to 1937, according to available records, there were 129 explosions in the coal mines of Alabama, which resulted in the death of 1,038 persons; 96 of these explosions were from gas, 23 from gas and dust, and 10 from dust.

This is by no means an enviable record, but if the above experience is broken down into 5-year periods a definite progress toward a better record is shown through a marked reduction in fatalities from explosions.

Period	Fatalities
1908-1912.....	349
1913-1917.....	150
1918-1922.....	166
1923-1927.....	121
1928-1932.....	23
1933-1937.....	37

Of the total of 129 explosions, 119 originated from the ignition of gas. The use of permissible electrical equipment, permissible explosives, electric cap lamps, rock dust, water, and various other means are essential to the prevention and limitation of explosions. However, enough air of breatheable quality, properly disseminated through the mine, is of paramount importance in removing the explosive gas; and unquestionably the most important single factor in preventing coal-mine explosions is the establishment and maintenance of an adequate ventilation system.

Results from Amended Law

Operators of all coal mines in Alabama rated as gassy furnish to the State mining department monthly reports on the methane content and volume of the mine air. This is advantageous to operators who have not been making such tests or surveys, because what might have been dangerous or hazardous conditions are often detected and corrected by this method before they reach the dangerous stage, whereas they might not have been detected at all if only flame safety lamps had been used, as ventilation surveys can be made when and where they are most needed.

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The operation of the amended law is decidedly advantageous to the workmen because through information obtained from its operation safe and breathable air can be supplied to the working faces, thereby increasing the ease with which men can perform their work in addition to decreasing the probability of gas ignitions and explosions.

CONCLUSIONS

Quantity and quality of air are essential from the standpoint of health and safety to mine ventilation. The most accurate information obtainable with reference to these essentials is mutually beneficial to operators and employees.

The use of detectors or the sampling and analysis of mine air enables mining companies to adopt measures to make a better distribution of safe and breathable air throughout the mines, and this safeguards and increases the efficiency of underground workmen as well as prevents the numerous horrors and property losses that accompany gas ignitions and explosions.

Figure 1, taken from a report issued by the Alabama Mine Inspection Department, shows that the trend of accident occurrence in Alabama has been downward, especially since about 1926, with the exception of the sudden jump in 1937 due to a mine disaster in which 34 were killed. It will be noted that there were no gas fatalities in 1928, 1932, 1935, and 1936. Apparently the mining law of Alabama, together with its enforcement, has been instrumental in reducing accidents and more particularly those due to gas ignitions and explosions.

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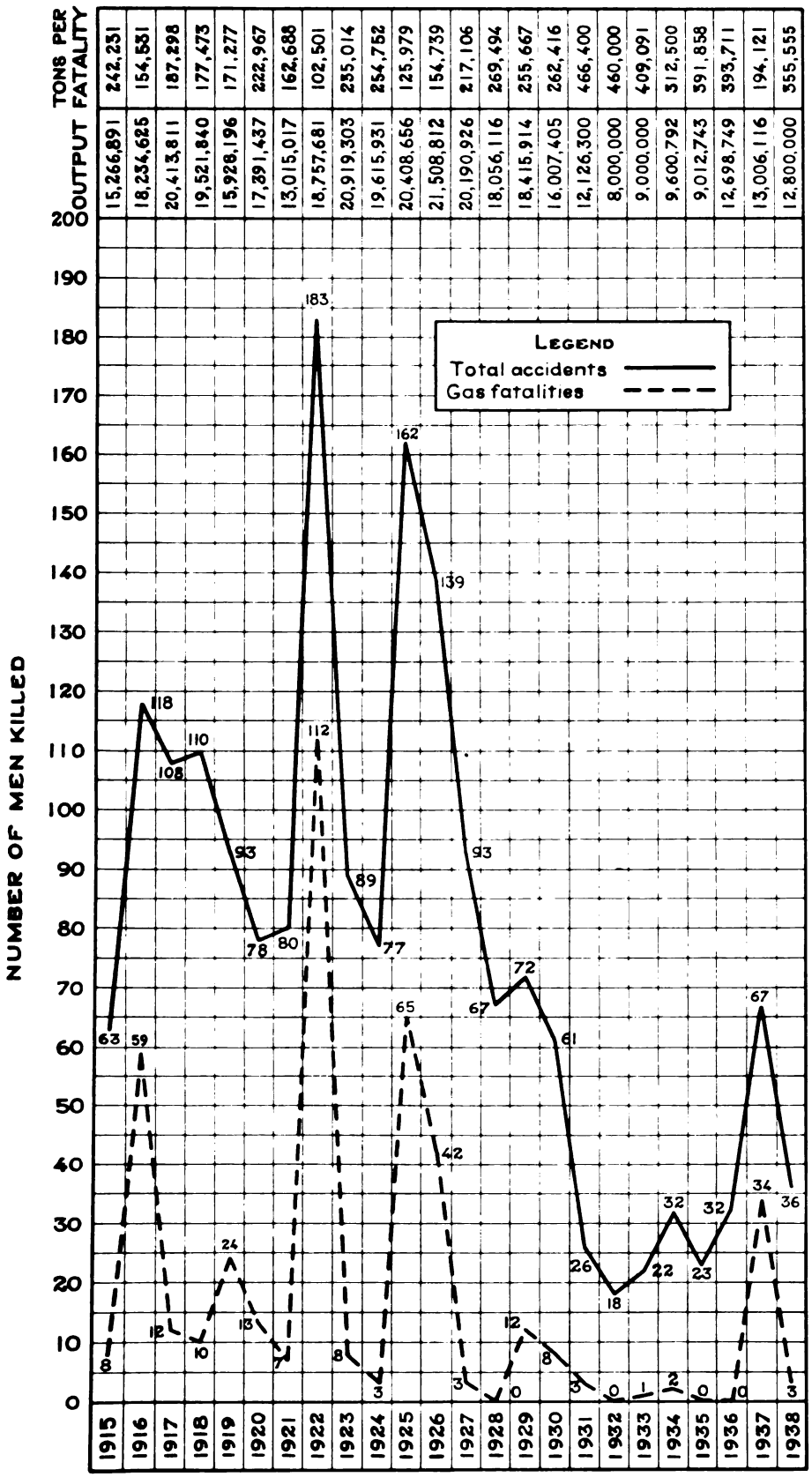

Figure 1.—Fatalities and total production by years in Alabama coal mines and tons mined per fatality.

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